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Publications



NATIONAL ENERGY BOARD REASONS FOR DECISION

In the Matter of an Application under
the National Energy Board Act

of

INTERPROVINCIAL PIPE LINE LIMITED

March 1980

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Ce rapport est publié
séparément dans les
deux langues officielles

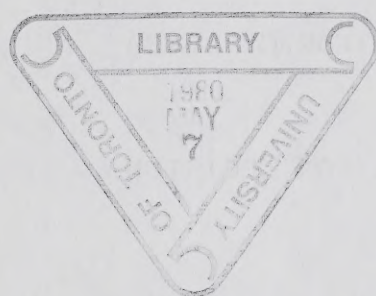


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Abbreviations

Terms

O.D.	- outside diameter
kPa	- kilopascal
D/t	- ratio of pipe diameter to pipe wall thickness
km	- kilometre
mm	- millimetre
m	- metre

Names

"CSA"	- Canadian Standards Association
"IPL" or "the Applicant"	- Interprovincial Pipe Line Limited
"the Board" or "NEB"	- National Energy Board
"Phoenix pipe"	- the 864 mm O.D. pipe manufactured by Canadian Phoenix Pipe & Steel Ltd. and installed by IPL in 1969.
"the Rules"	- NEB Rules of Practice and Procedure

NATIONAL ENERGY BOARD

IN THE MATTER OF an application by Interprovincial
Pipe Line Limited for a certificate of public convenience and
necessity under Part III of the National Energy Board Act.

(File No. 1755-J1-41)

HEARD at Edmonton, Alberta on 26 February 1980.

BEFORE:

J. Farmer	Presiding Member
J.R. Jenkins	Member
J.R. Hardie	Member

APPEARANCES:

E.G. Sheasby)	Interprovincial Pipe Line
Richard Smith)	Limited
Sandra K. Fraser)	National Energy Board

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BACKGROUND

Interprovincial Pipe Line Limited ("IPL" or "the Applicant") was incorporated by a Special Act of the Parliament of Canada assented to on 30 April 1949. The powers of the Applicant include those of constructing and operating interprovincial and international pipelines and related facilities for the transmission of oil. On 1 August 1973, IPL was granted letters patent continuing it as a company under the provisions of Part I of the Canada Corporations Act. As such, IPL is a "company" within the meaning of the National Energy Board Act ("NEB Act").

The Applicant owns and operates a pipeline system for the transportation of oil from Edmonton, Alberta to a point on the international boundary between Canada and the United States near Gretna, Manitoba, and from a point on the international boundary in the St. Clair River near Sarnia, Ontario to Montreal, Quebec, with branch lines from Westover, Ontario to a point on the international boundary in the Niagara River near Chippewa, Ontario, and to Nanticoke, Ontario. The pipeline system owned and operated by IPL is a "pipeline" within the meaning of the NEB Act.

As part of a looping program in Western Canada in 1969, the Applicant installed 75.1 km of 864 mm O.D. pipe ("Phoenix pipe") which was manufactured by Canadian Phoenix

Steel & Pipe Ltd. This pipe was installed in two segments: 51.2 km in the Edmonton-Kingman section and 23.9 km in the Strone-Hardisty section of the line. As a result of the construction of a 1219 mm O.D. loop completed in 1973, 14.3 km of the Phoenix pipe were taken out of service in the Edmonton-Kingman section.

During the period January 1974 to July 1979, IPL experienced five major failures in the two sections of its pipeline system containing Phoenix pipe. The failures were closely investigated by the Board and certain operating restrictions were imposed after the failures that occurred in 1974.

Because of the frequency and similarity of the failures IPL became concerned as to the integrity of the Phoenix pipe installed in 1969 and proposed to replace a total of 60.9 km of this pipe. During October 1979, IPL installed facilities to replace 15.2 km of the Phoenix pipe near the City of Edmonton (from Edmonton Station to Kilometre 15.2) under the authorization of Board Order XO-7-79. The subject of this report is IPL's application to replace the remaining 45.7 km of Phoenix pipe still in service.

In view of the size of IPL's replacement program and the degree of potential impact upon the environment, the Board set the application down for a public hearing by Board Order OH-1-80 dated 10 January 1980. The hearing was held in Edmonton on 26 February 1980.

THE APPLICATION

By an application dated 3 December 1979, IPL applied to the Board under Part III of the NEB Act for a certificate of public convenience and necessity to replace 45.7 km of its 864 mm O.D. pipeline during 1980 in the Province of Alberta. The proposed installation will complete the replacement of 60.9 km of 864 mm O.D. pipeline commenced in 1979 with the installation of 15.2 km of pipeline authorized by Order XO-7-79. Appendix I is a map showing the proposed replacement program. IPL proposes, as part of this application, to remove 2 to 3 km of the replaced pipe on an experimental basis.

The application also asked leave of the Board for exemptions from filing the information specified in:

- (i) Items (1), (2), (3), (6), (8), (9) and (10) of Part II of the Schedule to the Board's Rules of Practice and Procedure ("NEB Rules"). The Board granted this exemption under Section 5(1)(b) of the NEB Rules.
- (ii) Part II of the Board's Regulations designated ("Materials"). The Applicant later amended the application to include this information.
- (iii) Part VI of the Schedule to the Board's Rules in respect of environmental considerations. Leave was not granted by the Board for this exemption.

THE EVIDENCE

Phoenix Pipe Failures

The Applicant stated that it experienced five major failures in the sections of its pipeline system that contain the Phoenix pipe which was installed in 1969. The first three failures occurred in the Strome-Hardisty section of the Phoenix pipe during 1974 in a four-month time frame; the first occurring on 28 January, the second on 31 January and the third on 19 May. The remaining two failures occurred in the Edmonton-Kingman section of the Phoenix pipe on 23 June 1974 and 4 July 1979. (See Appendix 2 for exact location of Phoenix pipe).

The five failures all occurred by a similar mechanism, namely, the propagation of cracks located at the toe of the internal weld seam of the pipe. The origin of these cracks has not been positively established but it is suspected that the manufacturing process, to which the Phoenix pipe was subjected, may have played a role in the initiation of the cracks. The propagation of these cracks occurred during the normal operation of the line and may have been enhanced by environmental conditions involving sulphide or hydrogen reactions. The Applicant testified that failures of the type experienced in the Phoenix pipe installed in 1969 are not common and that this pipe appears to have a unique susceptibility to this type of failure.

IPL testified that the Phoenix pipe which is still in the existing line may contain cracks similar to those which caused the previous failures. In-situ identification and removal of the pipe containing these types of cracks would not be possible with any degree of certainty.

In analyzing the effects of the failures the Applicant noted that four of the five failures occurred during operating conditions and, consequently, became concerned about the continued integrity of the Phoenix pipe. The safety of the public, the environmental damage caused by the failures, and the disruption of supply to the markets served by the pipeline, were all major considerations in the decision to replace the Phoenix pipe.

Design Suitability of Pipeline Replacement

The Applicant stated that the Phoenix pipe would be replaced by pipe of the same diameter and would be manufactured in accordance with CSA Standard Z245.2 - 1974 and the Applicant's supplemental pipe specifications. The new pipe would be manufactured by the spiral weld process and would not be cold-expanded. This process is significantly different from the process used to manufacture the Phoenix pipe. It is noted that the 8.74 mm wall thickness of the new pipe is greater than the wall thickness of the Phoenix pipe to be replaced and is in accordance with the Board's Oil Pipeline Regulations which limit the D/t ratio of new pipe to 100.

IPL decided to replace the Phoenix pipe with pipe of the same diameter because of operational and maintenance advantages and because projected throughput requirements do not warrant expansion.

The new pipeline segments have been designed in accordance with the Oil Pipeline Regulations and the Canadian Standards Association Standard Z183-1977, Oil Pipeline Transportation Systems. The maximum operating pressure of the new pipeline would be 5230 kPa which is in accordance with the Board's Regulations. This maximum permissible pressure, although potentially higher than that of sections of the present system to which the new pipe would connect, can be controlled so as to prevent overpressuring of existing facilities. This control is performed automatically by a computer system which considers all operating variables and ensures that over-stressing of any section of the line is prevented.

Right-of-Way

IPL presently occupies an 18.29 m easement containing three pipelines. Lines 1, 2 and 3 were constructed approximately 12.2 m, 9.1 m and 6.1 m south of the north boundary of the existing right-of-way respectively. (See Appendix 3).

The Applicant testified that the majority of the proposed 864 mm replacement pipe would be located within its existing right-of-way approximately 3.05 m south of the north

boundary. However, four slough areas in the Strome-Hardisty section would require additional rights-of-way 12 m in width, due to the fact that Line 3 is located near the edge of the existing easement. IPL testified that it does not anticipate any difficulties in obtaining easements for this new right-of-way.

IPL stated that it would require 12.2 m of temporary working space immediately adjacent to the north boundary of its existing right-of-way to avoid the use of heavy equipment over its existing lines of pipe and that it would attempt to confine its construction operations to the minimum area required.

The Applicant testified that working rights had been obtained for all affected properties except one, and in the event that temporary working rights could not be obtained for the one property, construction activities could be confined within the existing right-of-way limits on that property.

IPL gave evidence that personal contact had been made with each landowner to explain the project in detail, and to record any specific concerns. The Applicant testified that no major concerns were expressed by the landowners contacted.

Construction Schedule

The Applicant proposes to commence construction on or about 16 June, with completion by September 1980. IPL undertook to file a detailed construction schedule and construction specifications with the Board prior to construction.

Environmental Aspects

The Applicant submitted an environmental impact assessment of the proposed replacement program. The report consisted of a description of the environment along the portions of the pipeline right-of-way where the new pipe would be installed, an assessment of the potential effects of pipeline construction on the environment and a discussion of procedures to avoid or mitigate the effect on the environment.

The Applicant's consultant indicated that the environmental impact in respect of this project would be minor because of the gentle terrain, the lack of major water crossings and the proposed use of the existing right-of-way. It was stated that any adverse environmental impact could be minimized by scheduling construction in the fall or winter but that there would not likely be any long-term effects as a result of the summer construction proposed by the Applicant as long as certain mitigative measures were taken.

The Applicant adopted the environmental assessment made by its consultants and the measures proposed to mitigate the potential environmental impact of the project. Where IPL's proposed construction practices varied from the consultant's recommendations, IPL provided an explanation and submitted comments regarding the differences.

IPL testified that it would take all steps necessary to minimize the impact of construction upon agricultural land. The Applicant would minimize the working area and the interference with farm operations. Access across the pipeline trench would be provided for use by the farmers. Topsoil would be stripped prior to construction, piled separately from the subsoil and replaced following construction. After construction, the right-of-way would be chisel-ploughed, disced and revegetated.

An environmental inspector and a clean up inspector would be on the site to monitor construction and to ensure that the specific concerns of landowners were met.

Following pipeline construction, IPL submitted that the actual pipeline route would be reassessed to determine the effect of construction on the environment, and additional mitigative measures would be undertaken if required.

Cost of Facilities

The Applicant's capital cost estimate of \$14,610,000 for the replacement program is summarized as follows:

Land	\$ 27,000
Pipe	6,446,000
Fittings	354,000
Construction	7,783,000
	<u>\$14,610,000</u>

Financing

IPL submitted in its application that the cost of the proposed replacement program would be financed from internal sources.

The Applicant was questioned about whether any attempt was made to recover the cost of the Phoenix pipe from the manufacturer or from any other person that could be responsible. IPL stated that the corporation which had manufactured the pipe had been dissolved and that IPL's insurance would not cover the cost of the pipe.

Canadian Content

The Applicant stated that the engineering would be carried out by its own employees. It also stated that all materials and equipment would be purchased from Canadian suppliers and that installation of the facilities would be carried out by Canadian contractors. The Applicant indicated that it intended to purchase line pipe from Interprovincial Steel and Pipe Corporation Ltd.

Replaced Phoenix Pipe

Upon completion of the replacement program all of the Phoenix pipe would be rendered inoperative. The Applicant indicated that after the 1980 construction it would propose to abandon in place the replaced pipe with the exception of approximately two to three km in a rural area of the Strome-Hardisty section, which would be removed.

IPL testified that during its discussions with the landowners the question of pipeline abandonment had been raised, and that it was apparent to the Applicant that the majority of

the landowners would prefer to have the pipe abandoned in place in order to minimize disturbance to their lands. IPL further testified that the removal of approximately two to three km of abandoned pipeline had been discussed with the landowners concerned and that no objections had been registered. The Applicant intends to remove this section of line immediately following the completion of construction of the replacement section to minimize land disruption and to confine the disruption to one construction season.

The experimental work IPL proposes to do with respect to the removal of two to three km of the replaced pipe is designed to establish techniques and costs involved in removing large diameter pipe from existing rights-of-way. Hopefully, this experimental work would make available information so that objective decisions on the removal of pipe from rights-of-way can be made. IPL indicated that it would be willing to file with the Board a report outlining the results of its removal project.

IPL indicated it would apply to the Board to abandon in place the remaining Phoenix pipe and that the procedures would be in accordance with the Oil Pipeline Regulations. This application would be made upon completion of the 1980 construction or possibly sooner.

FINDINGS AND CONCLUSIONS

The Board has considered all the evidence and submissions made concerning this application and has taken into account all matters which appear to it to be relevant. The Board also notes that there were no interventions to IPL's application.

The Board, in reviewing the history of the five major failures and taking into consideration the potential for future failures, concludes that the risks involved with the use of the Phoenix pipe in the IPL system are unacceptable. From the evidence, it appears that no practicable solutions exist insofar as the continued safe operation of the existing pipe is concerned and that the replacement of the Phoenix pipe is necessary. It is the view of the Board that this Phoenix pipe, which is to be replaced, should not be re-used in any pipeline system in the future. The Board notes that it would be IPL's intention to apply to the Board for leave to abandon that pipe, with the exception of the two to three km which IPL would remove.

With regard to the replacement pipeline, evidence indicates that it has been designed and would be constructed and tested in accordance with all the relevant regulations, codes, and standards. The Board is satisfied that the new facilities have been adequately designed and that consideration has been given to the present and future capacity requirements of the pipeline system.

The Board finds the estimated cost of the facilities to be reasonable and is satisfied with both the Canadian content and the proposed financing of the pipeline.

The Board is satisfied with IPL's proposal to make use of its existing right-of-way for the majority of its replacement program. The Board would require however, as a condition of a certificate, that it be kept informed of negotiations for land acquisition where new permanent right-of-way would be required.

The Board accepts the Applicant's requirement for temporary working space, and is confident that, if necessary, construction could be carried out on the existing right-of-way for that one property where working rights have not yet been obtained.

The Board is satisfied that all landowners had been contacted and were aware of the proposed pipe replacement program.

The Board concludes that the environmental impact of the proposed pipeline would be minimal provided the policies, practices and procedures included in the report and the recommendations of the environmental consultants to IPL or as adduced in evidence before the Board were implemented. In particular, the Board notes the Applicant's plans and procedures for construction across agricultural land, and would require IPL to implement all these procedures during pipeline construction.

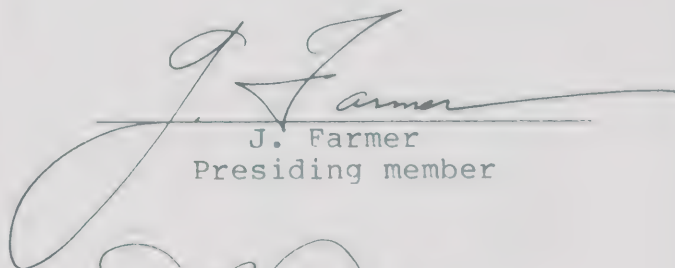
The Board finds that the summer construction schedule would have no long-term adverse effects on the environment and that the summer construction would be necessary to ensure the orderly, efficient, and economic replacement of the Phoenix pipe. The Board would require IPL to monitor crop productivity for three years after construction including comparisons of on and off right-of-way conditions and to report to the Board the results of this monitoring including any further soil restoration measures that might be warranted.

The Board is in favour of the proposed experiment to remove two to three km of the Phoenix pipe in order to develop removal techniques and associated costs. The results of the experiment could be very valuable in making future decisions regarding the removal of large diameter pipe from rights-of-way. The Board notes the statement by IPL that none of the landowners involved have any objections to the removal. The Board also agrees that the removal of the pipe should be done within the same time frame as the 1980 construction as this would avoid a second disruption of land in the area of the experiment. After the work has been completed, the Board would require IPL to file a report on the removal and restoration techniques used.

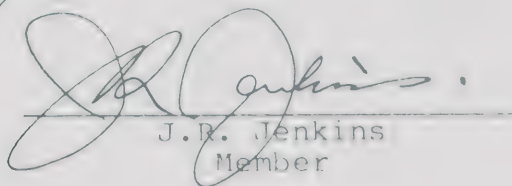
DISPOSITION

The Board, having considered all the evidence, argument and submissions presented to it with respect to IPL's application and having taken into account such matters as appear to it to be relevant, is satisfied that the replacement of the facilities as described in this application is and will be required by the present and future public convenience and necessity. The Board is therefore prepared, subject to the approval of the Governor in Council, to issue a certificate, upon the terms and conditions set out in Appendix 4 to this report.

Upon Governor in Council approval of the certificate, the Board would be prepared to issue an order authorizing the removal of a two to three km section of the Phoenix pipe in the Strome-Hardisty section.



J. Farmer
Presiding member

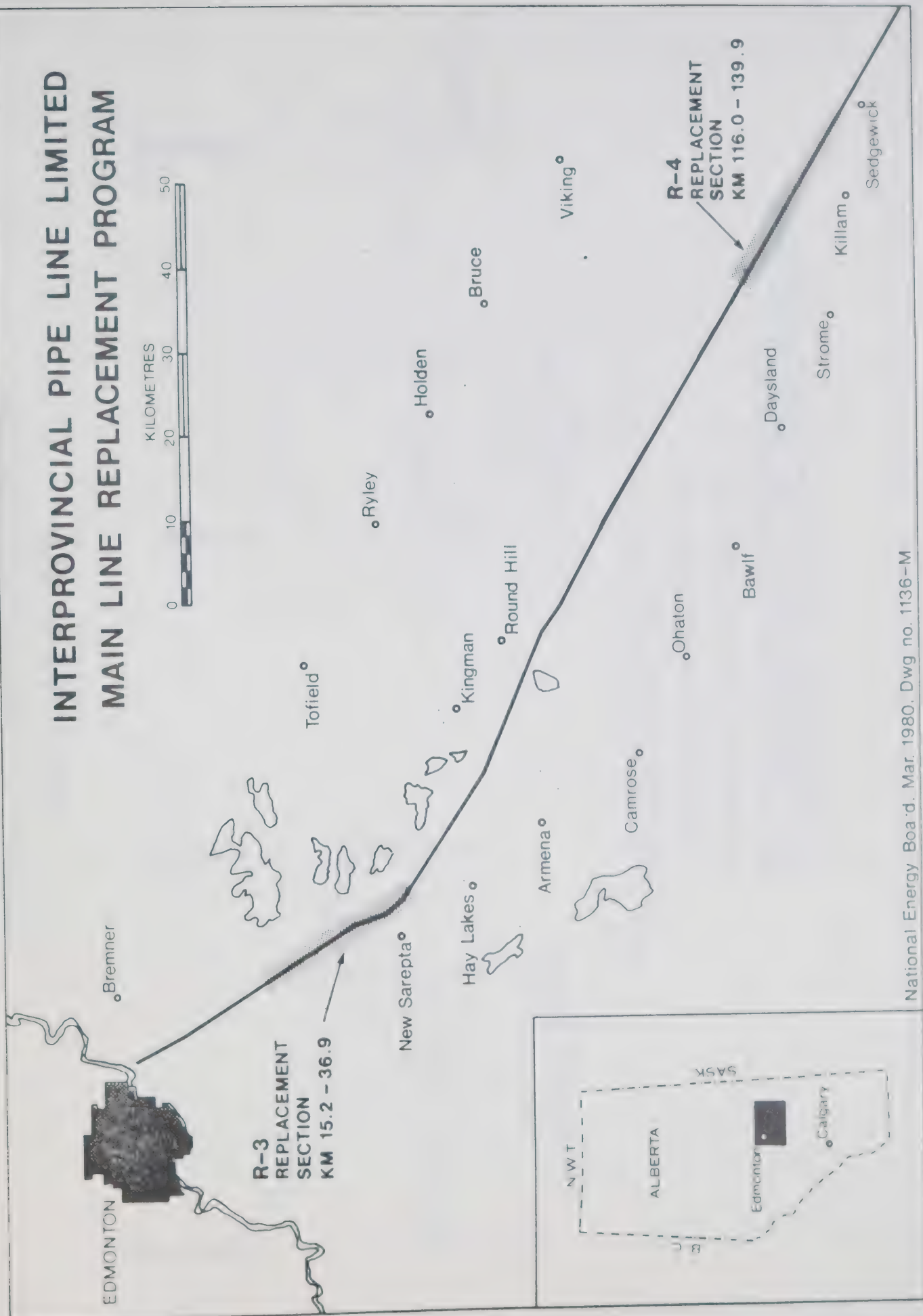


J.R. Jenkins
Member

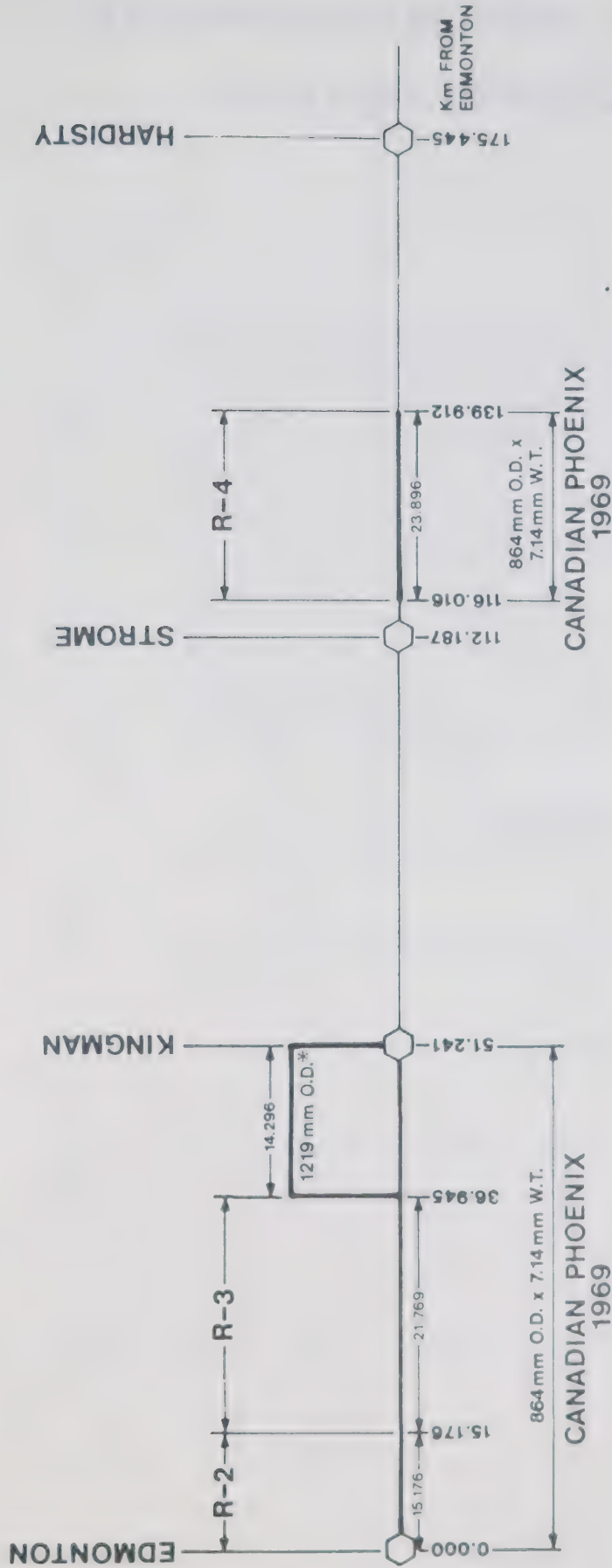


J.R. Hardie
Member

INTERPROVINCIAL PIPE LINE LIMITED MAIN LINE REPLACEMENT PROGRAM



INTERPROVINCIAL PIPE LINE LIMITED LOCATION OF CANADIAN PHOENIX PIPE (INSTALLED IN 1969)



NOTE: R-2 APPROVED BY BOARD ORDER No. XO-7-79
CONSTRUCTED FALL 1979

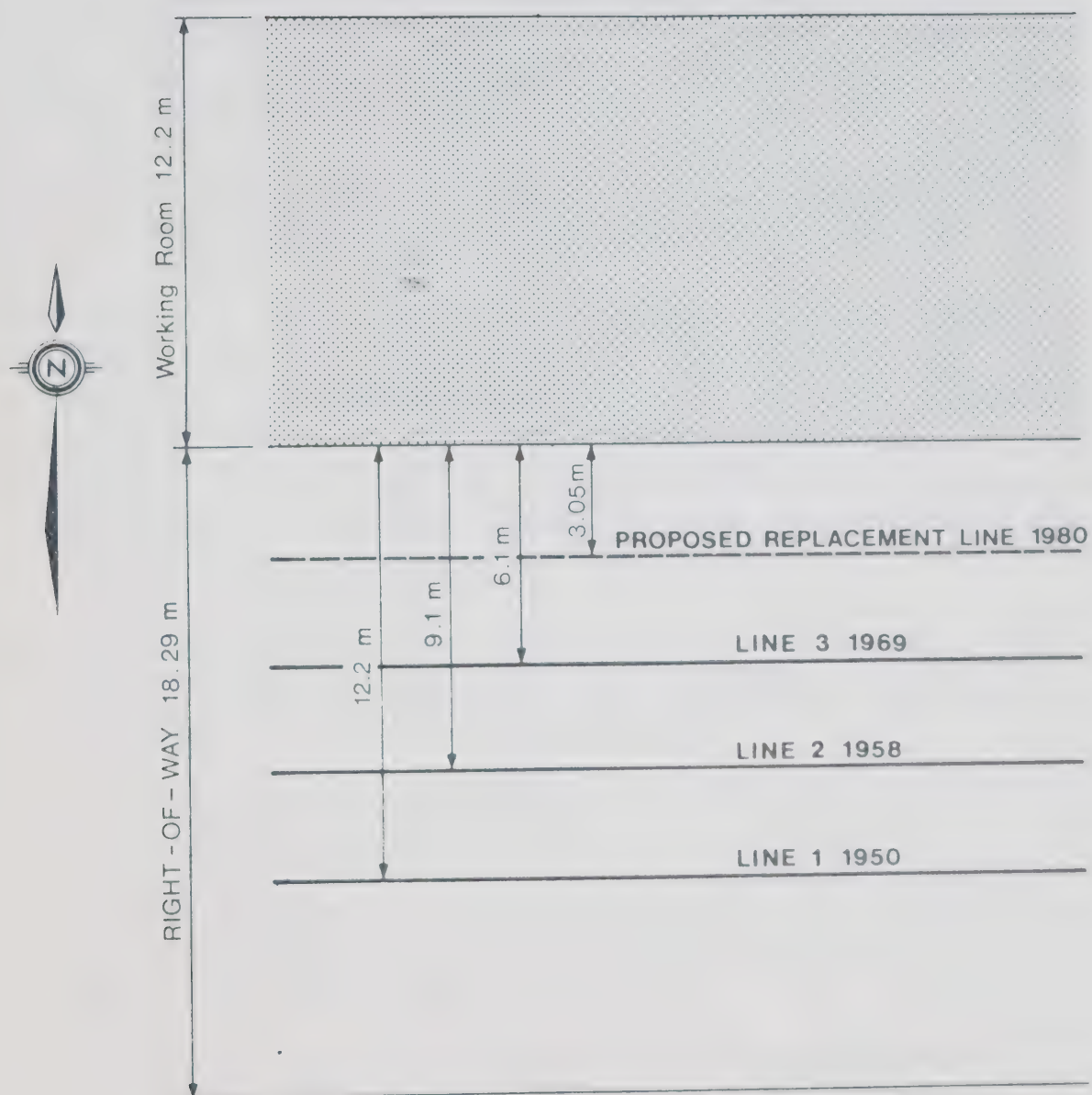
R-3 PROPOSED 1980 CONSTRUCTION

R-4 PROPOSED 1980 CONSTRUCTION

*THE 1219 mm LOOP WAS CONSTRUCTED IN 1972
& 1973 UNDER CERTIFICATE Nos. OC-25 & 27 RESPECTIVELY.
THE PHOENIX PIPE IN THIS SECTION IS NOT IN SERVICE.

INTERPROVINCIAL PIPE LINE LIMITED

EXISTING RIGHT-OF-WAY



APPENDIX 4

1. The additional pipeline facilities to be constructed pursuant to this certificate shall be the property of and shall be operated by IPL.
2. (1) IPL shall cause the additional pipeline facilities in respect of which this certificate is issued, to be designed, manufactured, located, constructed and installed in accordance with those specifications, drawings and other information or data set forth in the application, or as ordered, directed or approved by the Board, unless varied in accordance with subcondition (2) hereof, and those that are otherwise filed with the Board.

(2) IPL shall cause no variation in the specifications, drawings, and other design data and requirements, described in subcondition (1) hereof to be made without the prior approval of the Board.
3. IPL shall, unless otherwise authorized or ordered by the Board, implement or cause to be implemented all the policies, practices and procedures for the protection of farmlands and the environment included in the reports and recommendations of IPL's environmental consultants as adduced in evidence before the Board and as given in evidence by IPL officials and those authorized to speak on their behalf, and shall cause no changes to be made to the said policies, practices and procedures without the prior approval of the Board.
4. IPL shall file with the Board, concurrent with the filing of plans, profiles and books of reference, information setting forth the status of land acquisition where new permanent rights-of-way are required.
5. IPL shall monitor crop productivity along the right-of-way for three years after construction and shall report to the Board on the results of this monitoring, including a comparison of on and off right-of-way conditions and any further soil restoration measures that might be warranted, which report shall be made by the 31st day of December of each of the three years, unless upon application by IPL a later date is fixed by the Board.
6. IPL shall cause the construction and installation of the additional pipeline facilities to be completed on or before the 31st day of December, 1980 unless upon application by IPL a later date is fixed by the Board.

1. The additional pipeline facilities to be constructed pursuant to this Order shall be the property of and shall be operated by IRL.

2. (1) IRL shall cause the additional pipeline facilities in respect of which this certificate is issued, to be designed, manufactured, located, constructed and installed in accordance with those specifications, drawings and other information or data set forth in the application, or as amended, directed or approved by the Board, unless varied in accordance with subcondition (2) hereof, and those that are otherwise filed with the Board.

(2) IRL shall cause no variation in the specifications, drawings, and other data and information, as amended in subcondition (1) hereof to be made without the prior approval of the Board.

3. IRL shall, unless otherwise authorized or ordered by the Board, implement or cause to be implemented all the policies, practices and procedures for the protection of persons and the environment included in the rules and recommendations of IRL's environmental policy which are added in evidence before the Board and shall, in addition, evidence by IRL officials and shall cause the Board to be satisfied that the policies, practices and procedures are approved by the Board.

4. IRL shall file with the Board, concurrently with the filing of plans, profiles and books of reference, a statement setting forth the status of land acquisition and any permanent rights-of-way etc. required.

5. IRL shall monitor deep productivity along the right-of-way for three years after construction and shall report to the Board on the results of this monitoring, including a comparison of an and all right-of-way conditions and any further soil restoration measures that might be warranted, which report shall be made by the 15th day of December of each of the three years, unless upon application by IRL a later date is fixed by the Board.

6. IRL shall cause the construction and installation of the additional pipeline facilities to be completed on or before the 31st day of December, 1988 unless upon application by IRL a later date is fixed by the Board.

